Approach

SIMulation of Water Erosion (**SIMWE**) model

- Spatially distributed, process-based, single event, field and watershed scale model, that uses inputs derived via Monte Carlo methods
- Data requirements:

  DEM data

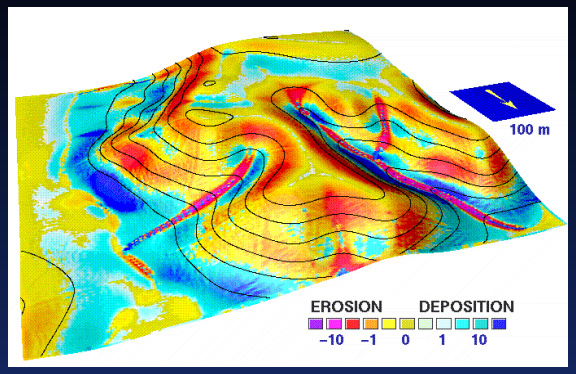
  Rainfall data (uniform rate)

  Surface roughness parameters

  Soil erodibility parameters (from USLE)

  Vegetation parameters (from USLE)

Approach



SIMWE

- Limitations and assumptions:
  Requires high resolution DEM data
  Does not incorporate channel flow (overland flow only)
  Assumes erosion is sediment transport capacity limited
- Applications:
  Provides accurate estimates in complex topography
  Modeling effectiveness conservation planning efforts
  Calculating net erosion and deposition

Approach

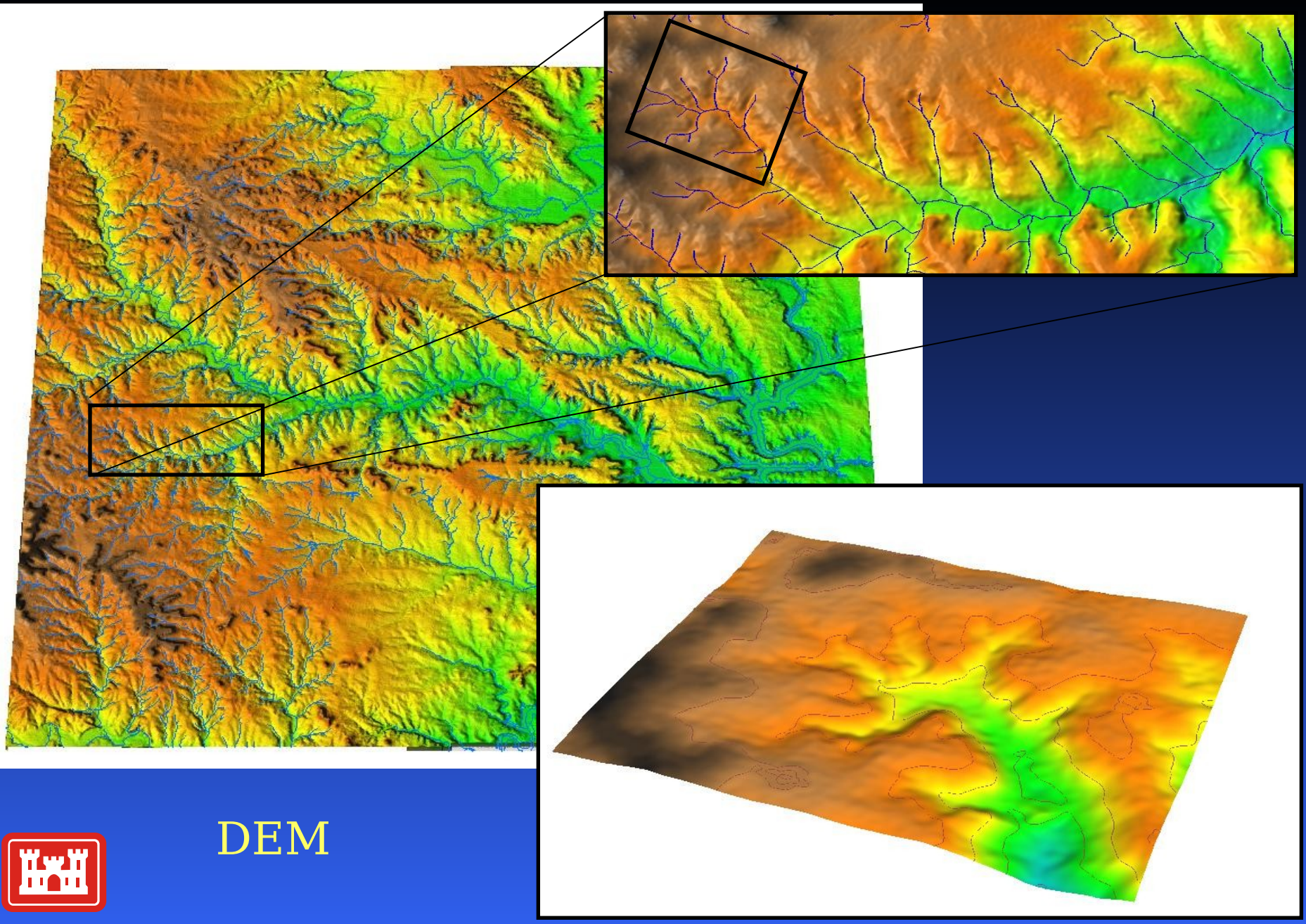
SIMWE

- Complexity/Use:

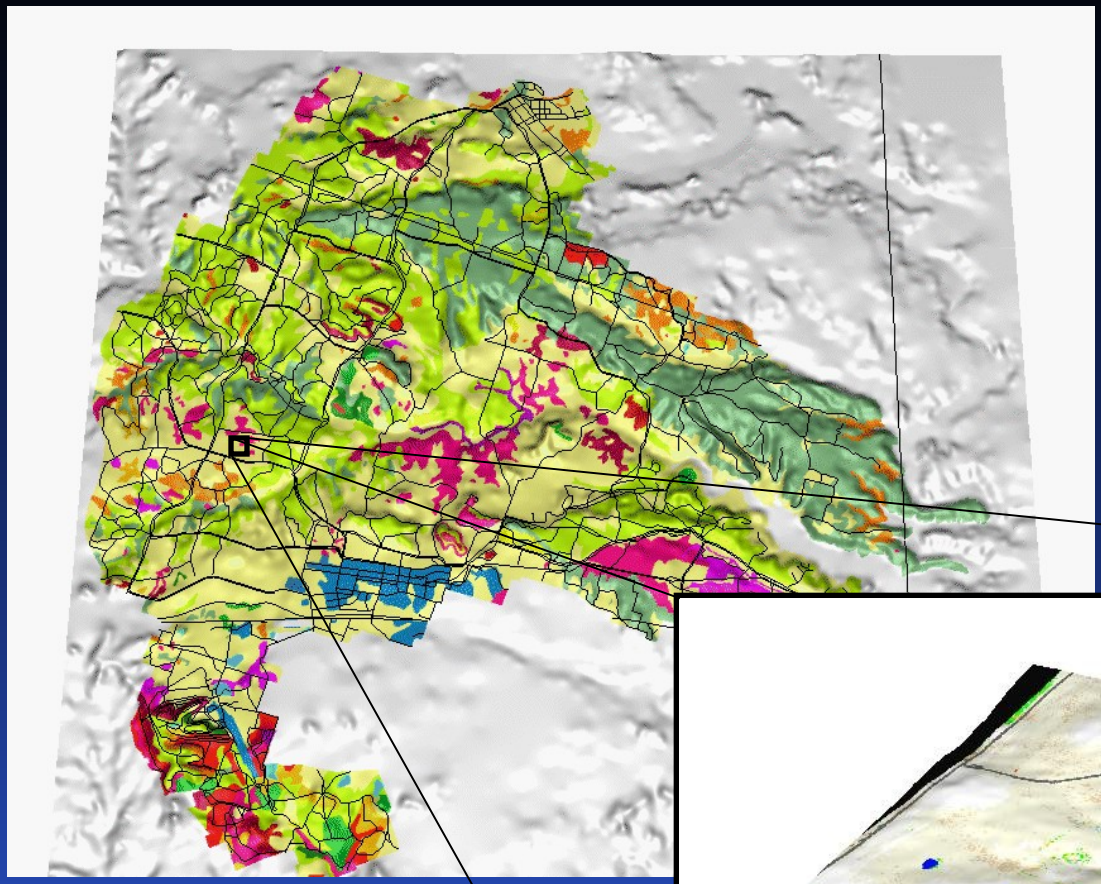
  Using COTS GIS, the model can be used to generate spatially distributed output.

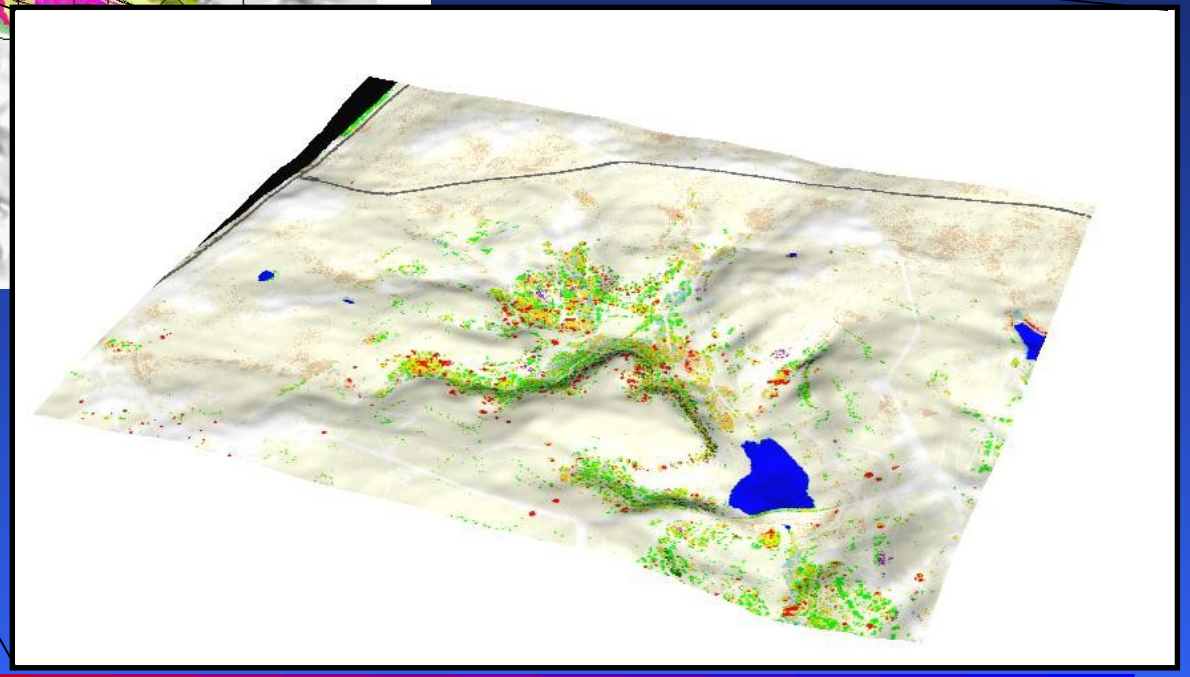
  USLE/RUSLE parameter values are available for most regions, but site-specific values will provide better estimates

  Performs best if DEM is smoothed using regularized spline with tension methods

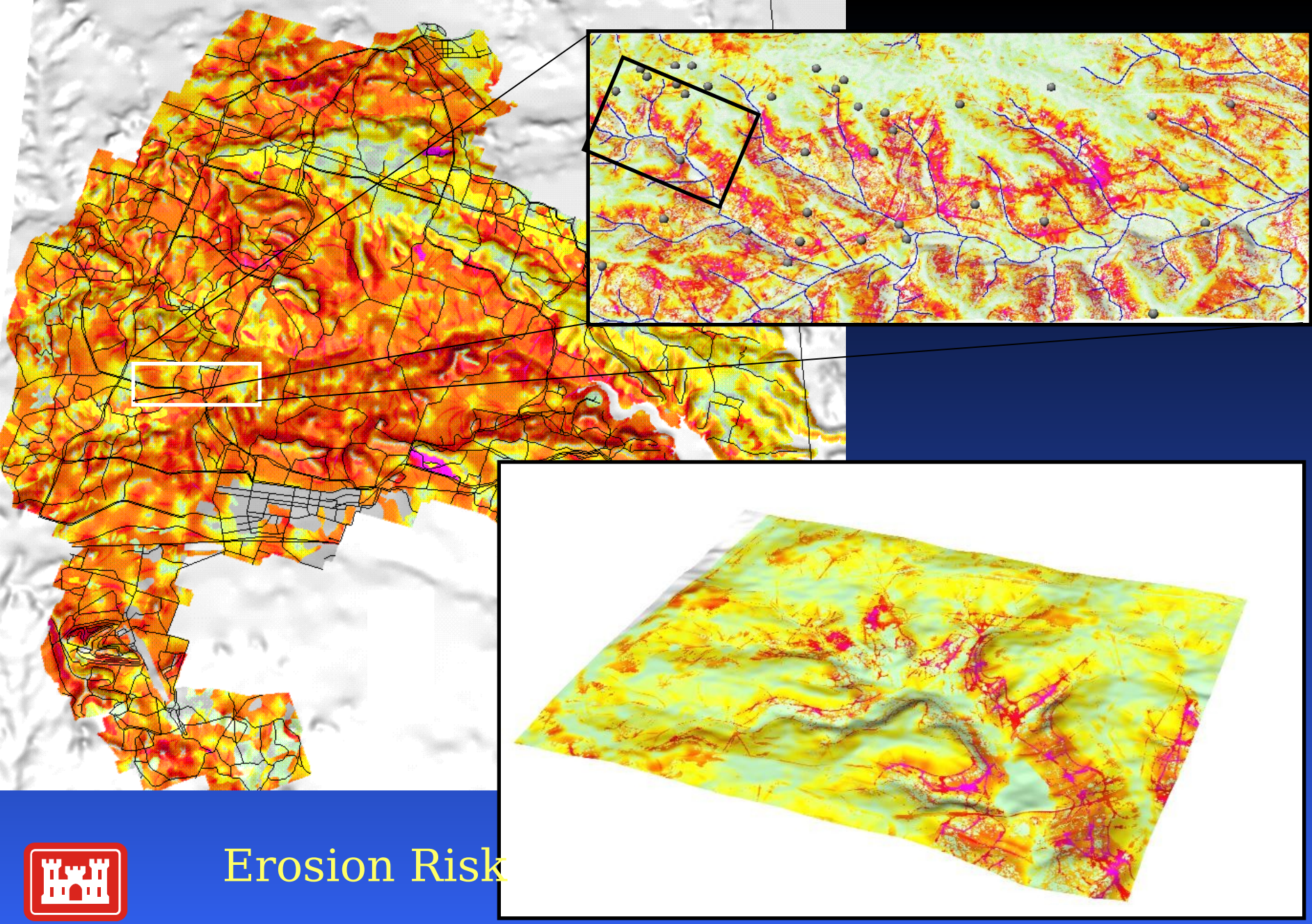


DEM





land cover/land use



Erosion Risk

Real World Applications

- Methods have been incorporated into the ATTACC methodology.
- At Pfändhausen Local Training Area in Schweinfurt Germany it was used to identify/design new maneuver areas that would limit the impacts of erosion and deposition.
- Case study development at Ft. Hood and Camp Shelby

Availability

- Tutorial distributed on compact disc
- Accessible via the web at the Defense Environmental Network and Informat eXchange (DENIX)

https ://denix.cecer.army.mil/denix/denix.html

- ERDC-CERL Technical Report

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